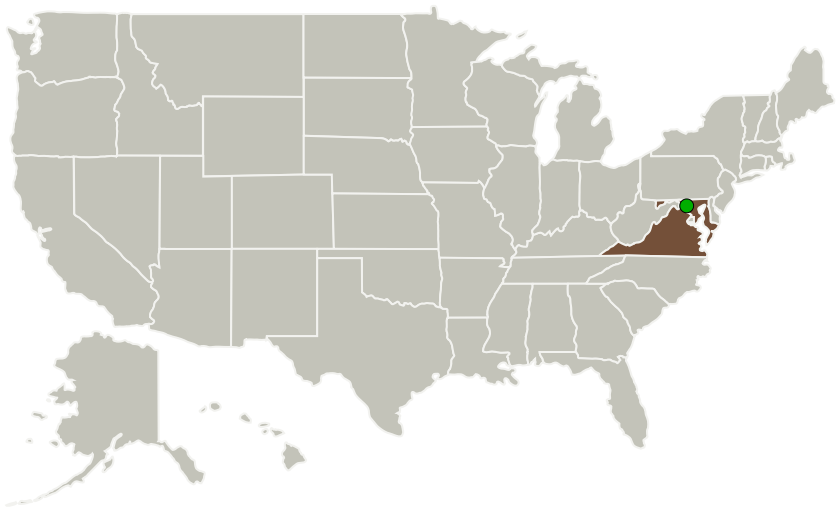
mmWave PolyStrata(R) High Power Compact Transceiver, Phase I

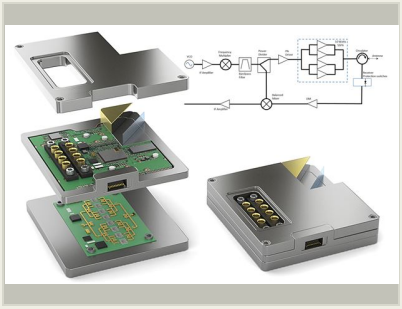
Completed Technology Project (2016 - 2016)

Project Introduction

In response to NASA SBIR Topic S1.02 on Microwave Technologies for Remote Sensing, Nuvotronics is pleased to propose a Phase I program focused on delivering an Ultra-compact W-Band High Power Transceiver. Our proposed plan is to take advantage of our PolyStrata ultra-low loss micro-coax transmission lines, high power high efficiency GaN power amplifier and Low Noise Amplifiers to provide a transceiver with over 10 Watts of CW RF power and with less than 6dB of received Noise Figure. The integrated PolyStrata micro-coax assemblies allow for a paradigm shift in design and manufacturing of advanced microwave and millimeter wave components supported by ultra-low loss transmission lines (0.03 dB/mm at 94 GHz), ultra-wideband (no cut-off), very high isolation (>80 dB) and no dispersion. This together with the highest functional density, integrated thermal management, scalability in power handling and frequency of operation enable novel architectures to be built in which the usual performance tradeoffs would no longer be necessary. In recent years, Nuvotronics has demonstrated multiple high power SSPAs from 30 GHz to 240 GHz, enabling mmW components using the disruptive PolyStrata micro-coax technology. Our architecture will also offer excellent thermal management using the PolyStrata bulk copper thermal conductivity of 400W/mK and the 3D RF backplane routing, which allow heat sink integrated directly under the MMICs for efficient heat spreading.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Nuvotronics, Inc	Lead Organization	Industry	Radford, Virginia
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Virginia

Project Transitions

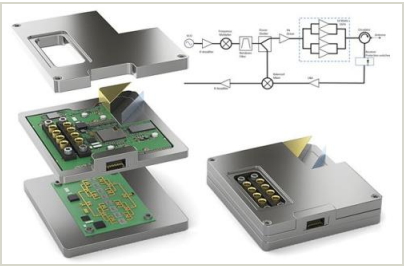
June 2016: Project Start

December 2016: Closed out

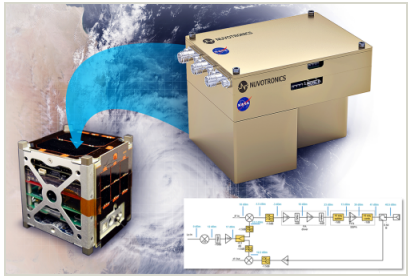
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139619)*

Images



Briefing Chart Image
mmWave PolyStrata(R) High Power Compact Transceiver, Phase I *(https://techport.nasa.gov/image/134542)*



Final Summary Chart Image
mmWave PolyStrata(R) High Power Compact Transceiver, Phase I Project Image *(https://techport.nasa.gov/image/135908)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Nuvotronics, Inc

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

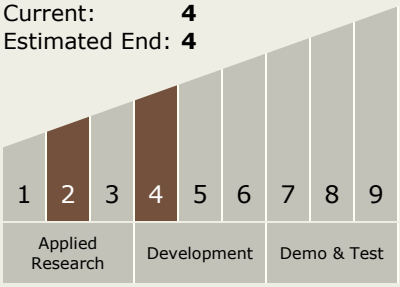
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Scott A Meller

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System